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The Parasitic Crustaceans of Fishes from the Brazilian Amazon. 9. *Ergasilus callophysus* sp. n. (Copepoda: Cyclopoida) from *Callophysus macropterus*

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ABSTRACT: *Ergasilus callophysus* sp. n. (Copepoda: Cyclopoida) is described from the gills of a fish, *Callophysus macropterus* (Lichtenstein), taken in the Amazon river near Manaus, Amazonas, Brazil. The new species has a curved pectinate seta on the first exopod that indicates a relationship to two previously described Amazonian species, namely: *E. bryconis* Thatcher, 1981 and *E. jaraquensis* Thatcher and Robertson, 1982. The new species has toothlike sensilla on the second and third antennal segments, however, which the other two species lack. *E. callophysus* sp. n. also bears a superficial resemblance to *E. cerastes* Roberts, 1969, but differs from this species in having a curved pectinate seta on the first exopod, a long fifth leg that reaches to the second abdominal segment, a reduced maxillule without setae, bifid mandible and palp, and a long third abdominal segment.

Up to the present time, the following three species of *Ergasilus* have been reported from the Brazilian Amazon: *E. bryconis* Thatcher, 1981; *E. leporinidis* Thatcher, 1981; *E. jaraquensis* Thatcher and Robertson, 1982; and *E. colomesus* Thatcher and Boeger, 1983. Additionally, Cressey and Collette (1970) identified some specimens from a needlefish (Belonidae) taken at Gurupá, Pará, Brazil as belonging to *E. orientalis* Yamaguti, 1939. In view of the high degree of host specificity found in Amazonian ergasilids by Thatcher and Boeger (1983), the presence here of a Japanese species seems doubtful. The present paper presents the description of the fifth verified Amazonian species.

Materials and Methods

Living ergasilids were killed and fixed in 70% alcohol. The methods used in their preparation and study were those explained in Thatcher (1981) and in Thatcher and Robertson (1982). Color determinations were made with reference to Smithe (1974). Drawings were made with the aid of a camera lucida and measurements with an ocular micrometer. All measurements are expressed in micrometers.

Systematic Section

Ergasilidae Nordmann, 1832

Ergasilus callophysus sp. n.
(Figs. 1–10)

HOST: *Callophysus macropterus* (Lichtenstein); Siluriformes.

SITE: Gill filaments.

MALE: Unknown.

LOCALITY: Amazon River, near Manaus, Amazonas, Brazil.

HOLOTYPE (female): Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Amazonas, Brazil, No. PA-237-1.

PARATYPES: INPA, Nos. PA-237-2 to PA-237-7; Museu de Zoologia da Universidade de São Paulo, S.P., Brazil, Nos. 3016, 3017; and U.S. Nat. Mus. No. 204987.

ETYMOLOGY: The generic name of the host was used as the species name.

SPECIES DIAGNOSIS (based on 22 specimens studied and 10 measured; Tables 1 and 2): Cephalothorax tapering posteriorly; rounded anteriorly; head fused with first two thoracic segments (Fig. 1). Eye prominent, bifurcate posteriorly, color cobalt blue (Color 68 of Smithe, 1974). Body pigmentation ventrally located, smalt blue (Color 69); pigment distribution indicated by dark areas in Figures 1, 2, 5–7, and 9.

Antennae (Figs. 2, 5; Table 2). Antennule of six segments, bearing simple setae, principally on anteroventral face; setal formula = 1-11-4-4-2-7; total = 29. Prehensile antenna four-segmented; basal segment subtriangular; second segment elongate, with toothlike sensillum located about midway on anterior margin; third segment elongate, slightly curved, with toothlike sensillum near distal end; segment 4 (claw) elongate, curved and sharply pointed, with simple sensillum distally on medial margin: ratio of segmental lengths = 1:2.5:2:1.

Thorax (including genital segment) of five free segments (Fig. 1). Segment 6 bearing vestigial fifth legs. Genital segment subrectangular (Fig. 6).

Abdomen (Fig. 6) three-segmented; first two segments with pigmentation. Each uropod with

Table 1. Measurements (μm) of 10 adult females of *Ergasilus callophysus* sp. n.

	Length	Width
Body (less caudal setae)	800–900 (860)	200–280 (239)
Cephalothorax	410–480 (441)	200–280 (239)
Free thoracic segments:		
3	65–88 (78)	173–225 (192)
4	70–88 (78)	130–163 (142)
5	50–68 (60)	73–125 (107)
6	25–33 (29)	75–98 (81)
7 (genital)	63–70 (66)	68–105 (86)
Abdominal segments:		
1	20–25 (23)	60–65 (63)
2	15–20 (17)	53–60 (57)
3	23–28 (25)	48–55 (52)
Uropods	28–43 (38)	20–23 (21)
Leg 5	68–88 (75)	–
Eggs sac	360–470 (384)	50–70 (61)
Caudal filament	230–340 (295)	–

Table 2. Antennal measurements (μm) of 10 adult females of *Ergasilus callophysus* sp. n.

	Length	Width
Antenna I (antennule)	130–170 (148)	20–30 (28)
Antenna II (prehensile)		
Segment 1	70–100 (91)	50–70 (56)
Segment 2	210–230 (225)	40–50 (47)
Segment 3	170–200 (188)	30–50 (38)
Segment 4	90–110 (102)	20

one long, one medium, and two short setae; with few spinules ventrally (Fig. 4).

Mouthparts (Fig. 10). Mandible two-segmented; bifid terminally; terminal segment bristled: palp bifid and bristled: maxillule simple, without setae: maxilla bifid and bristled.

Legs (Figs. 7–9; Table 3). Leg 1 (Fig.7); endopod two-segmented, exopod three-segmented; first endopodal segment laterally pectinate and with one plumose medial seta; terminal endopodal segment laterally pectinate and with two large rasplike spines and five short plumose seta: first exopodal segment with single posterolateral spine; second segment with a single medial plumose seta; terminal segment with two large rasplike spines, one curved pectinate seta, and four plumose setae. Legs 2 and 3 (Fig. 8) closely similar, all rami three-segmented; endopodal segment 1 serrate and sparsely pilose laterally and with a single plumose setae medially; endopodal segment 2 serrate laterally and with two plumose seta medially; endopodal segment 3 pectinate laterally and with four plumose setae medially; exopodal segment 1 pilose medially and with a single posterolateral spine; exopodal segment 2 pectinate laterally and with a single plumose seta medially; exopodal segment 3 pectinate laterally and with one large rasplike spine and six plumose setae. Leg 4 (Fig. 9); endopod of three segments and exopod of two; endopodal segment 1 pilose laterally and with a single plumose seta medially; endopodal segment 2 with two plumose setae medially; endopodal segment 3 with one large spine and three plumose setae; exopodal segment 1 pilose medially and with one posterolateral spine; exopodal segment 2 with one large spine and four plumose setae. Leg 5 (Fig. 6) of two long simple setae; dorsal seta longer; extends posteriorly to level of second abdominal segment.

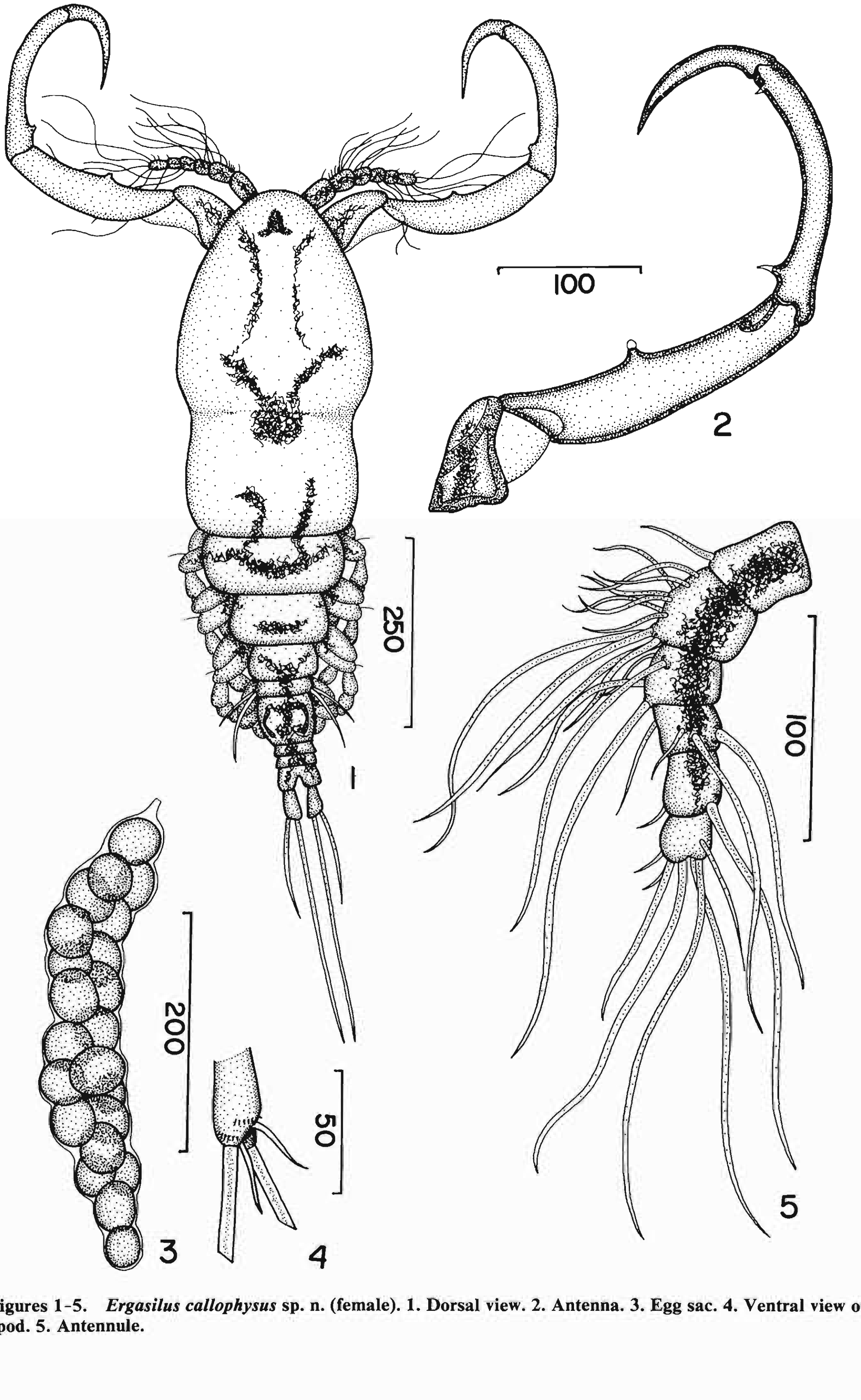
Egg sac (Fig. 3) elongate, with 20–50 spherical eggs.

Discussion

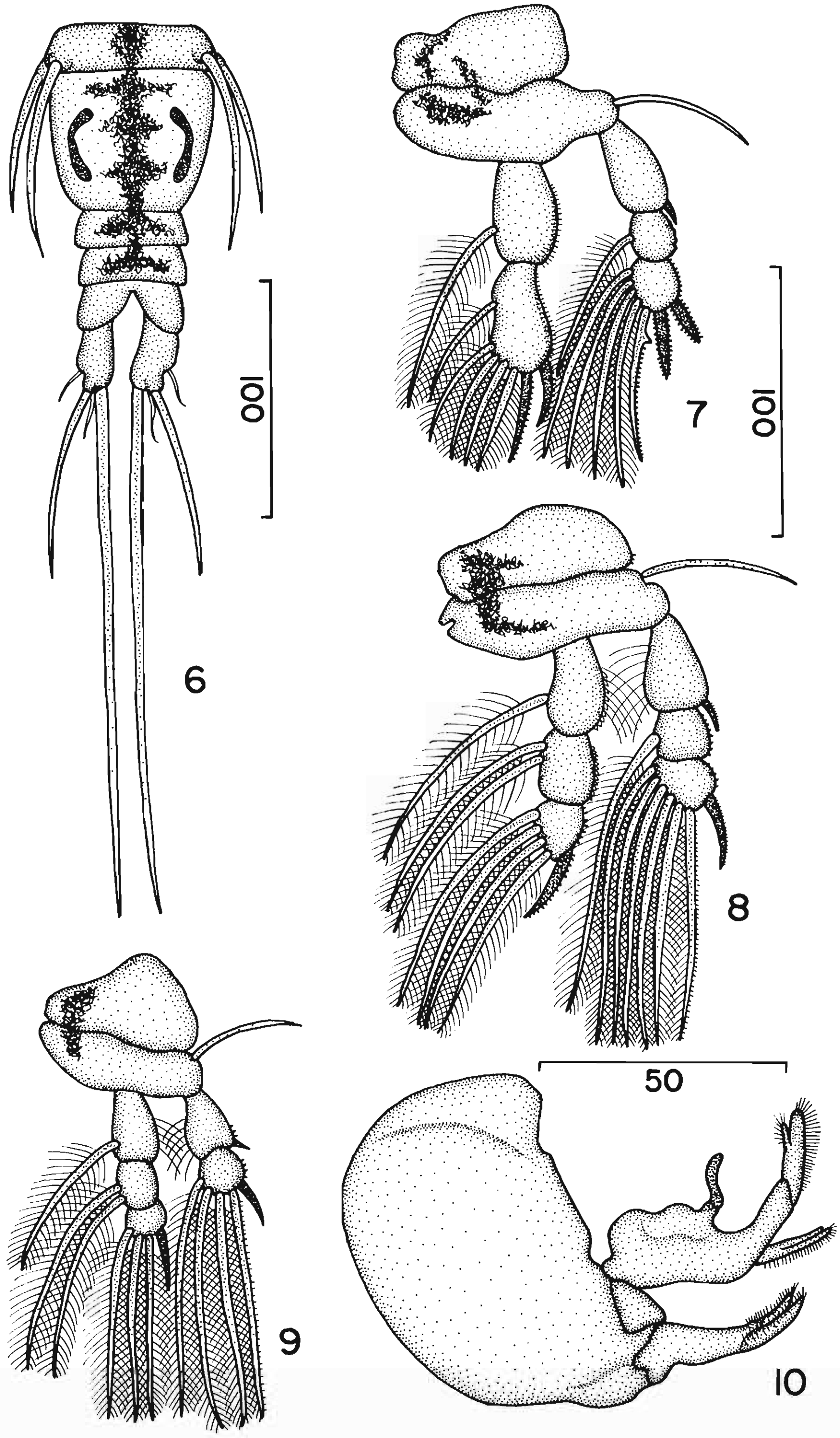
Ergasilus callophysus sp. n. has a curved and pectinate seta on the first exopod that suggests a relationship to the Amazonian species, *E. bryconis* Thatcher, 1981 and *E. jaraquensis* Thatcher and Robertson, 1982. The projecting, toothlike sensilla on the second and third segments of the prehensile antenna of *E. callophysus* sp. n. serve to separate it from the other two. Among North American ergasilids, *E. cerastes* Roberts, 1969, shows some similarity to *E. callophysus* sp. n. but these species can be distinguished by the following characters: (1) The new species has a curved pectinate seta on the first exopod, which *E. cerastes* lacks. (2) The fifth leg of *E. callophysus* sp. n. is long and reaches to the second abdominal segment, whereas that of *E. cerastes*

Table 3. Relationships of spines to setae on the legs of *Ergasilus callophysus* sp. n.

	Endopod	Exopod
Leg 1	0-1, II-5	I-0, 0-1, II-5
Leg 2	0-1, 0-2, I-4	I-0, 0-1, I-6
Leg 3	0-1, 0-2, I-4	I-0, 0-I, I-6
Leg 4	0-1, 0-2, I-3	I-0, I-4



Figures 1–5. ***Ergasilus callophysus*** **sp. n. (female). 1. Dorsal view. 2. Antenna. 3. Egg sac. 4. Ventral view of uropod. 5. Antennule.**



Figures 6–10. ***Ergasilus callophysus*** **sp. n. (female). 6. Genital segment, abdomen, and uropods. 7. Leg 1. 8. Leg 2 (=Leg 3). 9. Leg 4. 10. Mouthparts.**

is shorter, reaching only to the middle of the genital segment. (3) The maxillule of *E. cerastes* is provided with two setae which are lacking in the new species. (4) In *E. callophysus* sp. n., the mandible, palp, and maxilla are all bifid, whereas in *E. cerastes* only the maxilla is bifid. (5) The third abdominal segment of the new species is longer than that of *E. cerastes.*

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